CLAIMS

1. A programmable multiple current source comprising:

a plurality of current source circuits each including current level data storage circuitry, each of the plurality of current source circuits including an output terminal;

a current level data input terminal and a control input terminal connected to each of the plurality of current source circuits to supply current level data to the storage circuitry in each of the plurality of current source circuits;

peak detector and storage circuitry coupled to each of the output terminals of the plurality of current source circuits and including a peak signal output terminal; and

each associated current source circuit of the plurality of current source circuits including a master digital-to-analog converter coupled to the current level data storage circuitry of the associated current source circuit, a driver circuit having an input coupled to the master digital-to-analog converter and an output coupled to the output terminal of the associated current source circuit, comparator and storage circuitry having a first input coupled to the peak signal output terminal of the peak detector and storage circuitry, a

second input coupled to the output of the driver circuit, and an output, and current level adjustment circuitry coupled to the output of the comparator and storage circuitry and the input of the driver circuit.

2. A programmable multiple current source as claimed in claim 1 wherein the current level data storage circuitry includes a register and latching circuit.

3. A programmable multiple current source as claimed in claim 1 wherein the current level adjustment circuitry includes an adjustment digital-to-analog converter having an output coupled to the input of the driver circuit for supplying an adjustment analog signal in conjunction with a master analog signal from the master digital-to-analog converter.

4. A programmable multiple current source as claimed in claim 1 wherein the comparator and storage circuitry includes an addressable memory.

5. A programmable multiple current source as claimed in claim 4 further including an oscillator driving a counter, the

counter having an output coupled to the addressable memory for incrementing addresses.

6. A programmable multiple current source as claimed in claim 1 wherein the first input of the comparator and storage circuitry is coupled to receive a peak voltage signal from the peak signal output terminal of the peak detector and storage circuitry, the second input is coupled to receive a voltage representative of an output signal from the output of the driver circuit, and the comparator is constructed to compare the voltages.

7. A programmable multiple current source as claimed in claim 1 including a light-emissive display with a plurality of pixels arranged in an array of rows and columns, the output terminals of the plurality of current source circuits coupled, one each, to the columns of pixels in the display.

8. A programmable multiple current source as claimed in claim 1 integrated on a single semiconductor chip.

9. A display system with a programmable multiple current source comprising:

a light-emissive display with a plurality of pixels arranged in an array of rows and columns;

a plurality of current source circuits each including current level data storage circuitry, each of the plurality of current source circuits including an output terminal coupled, one each, to a column of pixels in the light-emissive display;

a current level data input terminal and a control input terminal connected to each of the plurality of current source circuits to supply current level data to the storage circuitry in each of the plurality of current source circuits;

peak detector and storage circuitry coupled to each of the output terminals of the plurality of current source circuits and including a peak signal output terminal;

each associated current source circuit of the plurality of current source circuits including a master digital-to-analog converter coupled to the current level data storage circuitry of the associated current source circuit, a driver circuit having an input coupled to the master digital-to-analog converter and an output coupled to the output terminal of the

associated current source circuit, comparator and storage circuitry having a first input coupled to the peak signal output terminal of the peak detector and storage circuitry, a second input coupled to the output of the driver circuit, and an output, and current level adjustment circuitry coupled to the output of the comparator and storage circuitry and the input of the driver circuit; and

the first input of the comparator and storage circuitry being coupled to receive a peak voltage signal from the peak signal output terminal of the peak detector and storage circuitry, the second input being coupled to receive a voltage representative of an output signal from the output of the driver circuit, and the comparator and storage circuitry being constructed to compare the voltages and supply a signal representative of the difference to the current level adjustment circuitry.

10. A method of calibrating a programmable multiple current source comprising the steps of:

providing a plurality of current source circuits each including current level data storage circuitry, each of the plurality of current source circuits including an output terminal;

supplying current level data representative of a first current level to the current level data storage circuitry in each of the plurality of current source circuits;

receiving an output signal representative of the output current at each output terminal of the plurality of current source circuits and sensing a peak output in the received output signals;

comparing the output signal representative of the output current at each output terminal of the plurality of current source circuits to the sensed peak output and generating an adjustment signal representative of a difference for each of the plurality of current source circuits;

storing the adjustment signal for each of the plurality of current source circuits; and

using the stored adjustment signal for each of the plurality of current source circuits to adjust the output current at each output terminal of the plurality of current source circuits.

11. A method as claimed in claim 10 including the steps of providing a light-emissive display with a plurality of pixels arranged in an array of rows and columns and connecting the plurality of current source circuits, one each, to each column of the display.

12. A method as claimed in claim 11 wherein the steps of supplying, receiving, comparing, storing, and using are repeated for each row of pixels in the display.

13. A method as claimed in claim 10 wherein the step of supplying current level data includes a plurality of current levels and the first current level is representative of a highest current level in the plurality of current levels.

14. A method as claimed in claim 10 wherein the step of supplying current level data includes supplying a plurality of

selected current levels and the steps of receiving, comparing, storing, and using are repeated for each of the plurality of selected current levels.

15. A method of calibrating a programmable multiple current source comprising the steps of:

providing a plurality of current source circuits each including current level data storage circuitry, each of the plurality of current source circuits including an output terminal, and each of the plurality of current source circuits being constructed to operate at a plurality of current levels from a maximum current level to a minimum current level;

supplying current level data representative of one current level in the plurality of current levels to the current level data storage circuitry in each of the plurality of current source circuits;

receiving a plurality of output signals, one each representative of output current at each output terminal of the plurality of current source circuits and sensing a peak output signal in the plurality of received output signals;

comparing the output signal representative of output current at each output terminal of the plurality of current source circuits to the sensed peak output signal to determine a difference and generating a plurality of adjustment signals, one each representative of the difference for each of the plurality of current source circuits;

storing the plurality of adjustment signals, one each for each of the plurality of current source circuits; and

using the stored plurality of adjustment signals, one each for each of the plurality of current source circuits, to adjust the output current at each output terminal of the plurality of current source circuits so that all of the plurality of current source circuits provide substantially matching output currents.

16. A method as claimed in claim 15 wherein the step of supplying one current level in the plurality of current levels includes the step of supplying the maximum current level.

17. A method as claimed in claim 15 wherein the step of supplying current level data includes supplying a plurality of selected current levels and the steps of receiving, comparing, storing, and using are repeated for each of the plurality of selected current levels.

18. A method as claimed in claim 15 including the steps of providing a light-emissive display with a plurality of pixels arranged in an array of rows and columns and connecting

the output terminals of the plurality of current source circuits, one each, to each column of the display.

19. A method as claimed in claim 18 wherein the steps of supplying, receiving, comparing, storing, and using are repeated for each row of pixels in the display.

20. A method as claimed in claim 18 wherein the step of supplying current level data includes sequentially supplying a plurality of selected current levels and the steps of receiving, comparing, storing, and using are repeated for each of the plurality of selected current levels for each pixel in each row of pixels.

21. A method of calibrating a programmable multiple current source in a display system comprising the steps of:

providing a plurality of current source circuits each including current level data storage circuitry, each of the plurality of current source circuits including an output terminal, and each of the plurality of current source circuits being constructed to operate at a plurality of current levels from a maximum current level to a minimum current level;

providing a light-emissive display with a plurality of pixels arranged in an array including a plurality of rows of pixels and a plurality of columns of pixels and connecting the output terminals of the plurality of current source circuits, one each, to each column of the plurality of columns;

activating a first row of pixels of the plurality of rows of pixels;

supplying current level data representative of one current level in the plurality of current levels to the current level data storage circuitry in each of the plurality of current source circuits;

receiving a plurality of output signals, one each representative of output current at each output terminal of the

plurality of current source circuits and sensing a peak output signal in the plurality of received output signals;

comparing the output signal representative of output current at each output terminal of the plurality of current source circuits to the sensed peak output signal to determine a difference and generating a plurality of adjustment signals, one each representative of the difference for each of the plurality of current source circuits;

storing the plurality of adjustment signals, one each for each of the plurality of current source circuits;

using the stored plurality of adjustment signals, one each for each of the plurality of current source circuits, to adjust the output current at each output terminal of the plurality of current source circuits so that all of the plurality of current source circuits provide substantially matching output currents; and

activating each remaining row of pixels of the plurality of rows of pixels, one at a time, and repeating the steps of supplying, receiving, comparing, storing, and using for each activated row.

22. A method as claimed in claim 21 wherein the step of supplying one current level in the plurality of current levels includes supplying the maximum current level.

23. A method as claimed in claim 21 wherein the step of supplying current level data includes sequentially supplying a plurality of selected current levels and the steps of receiving, comparing, storing, and using are repeated for each of the plurality of selected current levels for each pixel in each row of pixels.